

Oil Price Benchmarks in International Trade

CHRISTOPHE BARRET offers insights from the assessment process.

Brent prices: physical or future prices?

Oil prices' return to record high levels has reignited the debate on oil price formation. The dual aspect of oil – investment product and commodity used in the production of commercial fuels – has helped to develop a schizophrenic approach to oil price formation. On the one hand, oil prices are seen as resulting from financial investors' investment in commodities, always on the long side, helped by recent financial innovations promoting investment diversification.

On the other hand, oil prices must be compatible with oil market balances, or there is an excess of physical oil and ever-growing inventories.

At the heart of the debate are the relationships between oil futures prices and the physical price for oil. More recently, it has been argued that futures prices impact physical prices in a direct manner, through the methodology of the assessment process or the Price Reporting Agencies. A detailed look at the process of price assessment

by PRAs shows that it is unlikely to be the case. On the contrary, it appears that changes in PRAs' methodology in the past ten years, first developed to avoid price manipulation, today can guarantee an anchor to the physical market for oil prices.

Brent Marker Remains Essential

Most physical crude trade is done in Over-the-Counter (OTC), non-public, deals between oil producers, traders and refiners. Oil prices are therefore not directly visible,

but are rather assessed and reported by PRAs shortly after the end of the trading day. Oil is exchanged through long-term contracts or spot purchase agreements. In most deals, term contract or spot trade, oil is priced at a differential to a marker, which is the price of a particular crude oil, reported by a particular PRA. Brent-related prices are the marker for more than 50 percent of world crude trade.

Dated Brent price assessments used the most by the industry are those of Platts and, to a lesser extent, Argus. Both PRAs use a broadly similar methodology. The process of assessment has evolved with the Brent contract and market practice. Until the end of the 1990s, journalists used to call market participants and brokers at the end of the trading day to get a sense of prices (forward, dated and grades) and deals concluded during the day, and published their assessment often based on a simple average. The process is very different today as, for the purposes of assessment, a large number of the deals in different markets have become organised, controlled, visible and the rules of assessment are defined more precisely. PRAs' Dated Brent price assessment process is no longer simple – but it has become more reliable and offers less room for price distortion.

The process involves the sequential assessment of various grade differentials to Dated Brent strip, the assessment of Contracts-for-Differences (short-term swaps) for the weeks around the assessment period as a differential to forward contract, and finally the assessment of the forward contract (known as the 21-day or, since 6 January 2012, the 25-day contract) – the only flat price assessment in the process. The computation of the Dated Brent quote published by the PRAs follows a reversal of the chronological process of assessment: it starts with Forward 25-day prices (assessed last), used together with CFDs to compute North Sea Dated Strip (anticipated Dated), from which the prices of Brent, Forties, Oseberg and Ekofisk are computed using an assessment of their differentials ... and finally Dated Brent is computed as the most competitive (minimum) of the four grades.

The Assessment of Grade Differentials, CFDs and Forward Brent: Platts' Window

Platts' European crude price assessment

occurs every business day, mostly between 4:00 pm and 4:30 pm. Platts has a dedicated room where assessment occurs, which looks pretty much like a small trading floor, where price editors are organised by desk covering a particular product. Bids and offers are generally communicated to Platts' editors by Yahoo messenger and, when the technology is available to the market concerned, immediately put into Platts' 'Ewindow', a trading platform, and on a dedicated page of its wire service (PAG003). Main market participants also have Ewindow installed on their own computer, so that they can put their bids and offer directly on the system. The Ewindow software interface has been developed by ICE for Platts, and looks pretty much like the ICE interface. It is a trading platform with Platts' rules. Participants put their bid and ask into Ewindow and, when a deal is done, can clear this OTC deal on ICE (if they have configured the software that way). Through Ewindow, market participants have immediate knowledge of offers and bids on a particular contract. Platts' editors can intervene if they think that the changes in bids/ask are too large, prices are 'out of the market' or a deal appears to have been agreed for pricing reasons (for example a participant accepts an offer from A at a higher price than an existing offer from B). It is an OTC market, so participants know who is offering what.

Bids and offers of market participants are communicated to Platts' editors in a precise time frame, called 'Platts' window', and can be modified in the assessment period under precise rules. Market participant interest in North Sea crude oil, generally expressed as a bid or offer on a differential to Dated Brent or to Forward 25-day Brent contract, should be expressed before 4:10 pm. Other physical grades commonly traded during the window, such as Ural or West African crude oil, should be presented to the window slightly earlier. Market participants can change their bids and offers on the physical grades until 4:25 pm. The assessment of CFD occurs between 4:15 pm and 4:25 pm. The assessment of Forward Brent contracts (for the next three months) occurs in the last five minutes of the window, between 4:25 pm and 4:30 pm. The basis for Platts' assessment is Market On Close (MOC) methodology, which states that the assessment should reflect the latest

trade(s) happening in the window. For the Forward Brent, the last seconds of the window before the 4:30 pm cut off, are particularly crucial for price determination and introduce significant stress for both Platts' editors and large North Sea traders. The aim of MOC methodology is to reflect market prices at the end of the assessment period. It also has the advantage of improving liquidity, because it concentrates trades in a very short time period. Most big players are present in the window between 4:00 pm and 4:30 pm and, having carefully prepared their trades before the window, can quickly post and modify their bids and offers.

Argus has a slightly different methodology, and uses the average of deals transacted between 4:29 pm and 4:30 pm to assess Forward Brent prices. Deals are reported to Argus by market participants, in general before 5:00 pm, and posted by the PRA on Argus Crude Oil Bulletin Board. The result looks pretty much like Platts PGA003 page. Some large participants send Argus every day a list of what they did during the window. While Argus mentions in its methodology guide that, in the event there is no bid or Forward Brent it uses an estimate based on EFP and future prices, this almost never happens. The assessment process covers three main elements: the grades (physical crude oil), the CFDs and the Forward Brent (25-day).

In a typical assessment day, bids for non-North Sea crude (Urals) start to appear first, around 15:45. North Sea crude bids appear slightly after 4:00 pm. Bids and offer are generally presented at a differential to Dated Brent or to the front month of the Forward Brent contract. Participants have until 4:25 pm to modify their bids and offers, in order to achieve a deal. Bids appear on Ewindow and on a specific page of Platts' wire service (PGA003), so their evolution can therefore be followed by the whole market.

CFDs are assessed then, in part in the same time frame as the grades. These are short-term swaps of the price of Dated Brent to be assessed in the next few weeks vs. the second month of the Forward Brent contract (25-days), with cash settlements, covering 8 calendar weeks from the date of their assessment (included in the first week). By buying or selling CFDs, market participants can guarantee a price for the week of crude deliveries equal to Forward Brent +

CFD for the week, therefore obtaining a more precise hedge of their risk than by using futures or forward contracts only. The market for CFDs is very liquid and assessed in Platts' window, between 4:15 pm and 4:25 pm. Considering Argus data of deals happening in the window between January 2006 and Dec 2011, deals appear to occur mainly for contracts of 100 kbls, 200 kbls or 300 kbls. Roughly 55 percent of the deals are for 100kbls contracts, 24 percent for 200kbls, 6.5 percent for 300kbls and 2.5 percent for 500kbls. The market appears very active, as there are on average more than six deals happening every day. There are many participants in the CFD market, with as much as 45 companies trading regularly. These include oil companies, oil traders and some banks. However, 12 of the 45 participants – the large physical participants – account for more than 80 percent of the trades.

Finally, Cash BFOE prices (Forward Brent) are assessed in the last minutes of the window for three forward months. These are forward contracts for a particular month, with no specified date of loading. In most cases, Cash BFOE prices refer to partial cargoes (of 100 kbls) and start to be offered before 16:24. Between June 2007 and the end of 2011, in the Argus database of deals happening during the window, partial 100 kbls represented 80 percent of total deals, 200 kbls 12 percent, 600 kbls (a complete cargo) 3.5 percent and 300 kbls 3.25 percent. Large volume contracts (600kbls) trade most the day following the expiry of the ICE Future contracts (16 of the month), as Forward Brent participants want to influence the settlement of the future contract. The volume of Forward Brent deals has significantly increased since 2008, rising from 200 kb/d in 2008 to 540 kb/d in both 2010 and 2011. Prices can be modified through 16:30. The last seconds of the window are particularly active, as Platts' Market on Close methodology makes deals occurring at the end of the window particularly important. The assessment process ends at 16:30:00:99, when a Platts' editor shouts 'Time!' in the assessment room. Argus has a slightly different methodology, considering an average of deals happening in the last minute of the window (16:29–16:30). The three months of Cash BFOE are the only flat prices discussed in the window and serve as a reference for the computation of all other assessments. The Forward Brent

contract is a very small club, with a limited number of participants: big oil traders and large oil companies. In the window, roughly ten participants contribute to the contract assessment. Shell, Total and Vitol make roughly half of the trades reported. Even though 80 percent of the trades concern partial cargoes of 100kbls, participants must be ready to take delivery of physical cargoes and able to participate in the window.

The Dated Brent quote is then computed from the various assessments. This quote is particularly important because it is the price included in many contracts related to Brent. With the assessment of the second month Forward Brent contract and CFDs for the period covered in the assessment, PRAs compute a North Sea Dated Strip which would represent the average price of Dated Brent that can be guaranteed today for delivery in the 10–25 days of assessment. This Dated North Sea Strip will be the basis to which apply grade differentials, as it represents an expectation of the value of Dated Brent at a particular time of loading. By doing so, an outright price for Brent, Forties, Oseberg and Ekofisk is computed from the differentials assessed in the window and the Dated North Sea Strip. Dated Brent quote for the day is then computed as the cheapest of the four grades Brent, Forties, Oseberg and Ekofisk.

The process of price assessment by PRAs has drastically changed in recent years. It moved from a situation where PRAs were observers of market trades, with reporters calling market participants at the end of the trading day, to a situation where they are organising the exchanges in a particular way, to obtain what they believed to be the most representative prices. If market participants want their activity to be reported (and to impact the quotes) they must follow the rules and guidelines established by PRAs. Although the physical crude market remains essentially OTC, the activity on the main price markers is public and observable by any participant in the market.

Looking precisely at PRAs' price assessment methodology, there is no direct impact of future prices on the physical oil price assessment. Dated Brent quote results from Forward Brent assessment within the window, CFDs assessment and grade differential assessment. All these assessments occur in a process of transparent

bids and offers, largely dominated by the main physical oil market players. The link between futures and forward (therefore spot) prices exists, however, but is more linked to market practices than to the process of price assessment. As such it can be broken if need be. In addition, it is a two-way relationship: futures prices may influence Forward prices and the physical market has an impact on future markets.

The Link between Futures, Forward and Physical Prices

While futures prices do not directly enter in the physical price assessment of Dated Brent, they can affect physical crude prices in several other ways.

First, prices for certain exports of Middle Eastern countries to Europe are directly indexed on a transformation of futures prices. Saudi, Kuwait or Iranian crude oil sold to Europe, are directly indexed on a weighted average of ICE Brent prices (BWAVE) in a trading day (prices weighted by volume). Saudi Aramco announces with roughly one month notice (at the start of month t for month $t+1$) the value of the differential for its crude to oil companies, and the price paid by the buyer is based on an average of ICE Brent price around the day of cargo arrival corrected from the differential previously announced. Oil companies do not have the opportunity to negotiate the price, but they can slightly adjust their crude intake of Saudi grades based on the amount contracted. For these crudes, a change in futures prices (front month) has automatically an impact on prices. In addition, ICE Brent contract converges to Forward Brent at its settlement, even though numerous differences between ICE Brent contract and Forward Brent contract could make their prices different. Indeed, these contracts trade on different kinds of markets (OTC and futures), concern different volumes (futures Brent contracts are for 1000 bls while in the forward market, most exchanges refer to Partial Cash BFOE of 100 kbls) and, while the forward contract can end with a physical delivery or a book out, futures Brent contracts have in general a cash settlement. In addition, the two contracts do not concern the same period. ICE Brent contracts expire on the 15th of the month, on an average of the value of Front month Forward contract in

the next day which, at the time, refers to a relatively limited number of cargoes. On the 16th of January, the forward February contract refers to cargoes loading in more than 25 days and before end February, i.e. between the 10th and 29th February (or even less time if we take into account the loading period).

In practice, however, futures and forward prices remain very close to each other, in particular at the end of the window. ICE publishes every day a minute market, showing a weighted average of prices on the futures market between 4:29 pm and 4:30 pm. The spread between the absolute value of the minute marker and the Forward Brent assessment is, on average, 14.3cts/b between 2007 and 2011, while the futures/forward spread is more than \$1/b at the opening and \$0.64/b at the close of the market. Futures prices have a tendency to converge to Forward prices at 4:30 pm.

One of the reasons for the convergence is the fact that big oil participants have a portfolio including both Forward and Futures contracts. These can move from one market to the other through Exchanges for Physical (EFP), a direct link between the two markets. An EFP operates a switch between the positions of two participants in futures and forward markets. It transfers the position of a market participant on the ICE futures market to the Brent forward market, therefore giving an option for a subsequent physical delivery. The forward position of the second participant is, in turn, transferred to ICE. Through EFPs, a strong link is introduced between physical and futures markets. EFPs for the first three months are quoted by brokers and are generally inexpensive. We see the current market practice of big players having both instruments in their portfolios and

arbitrating between futures and forwards as the main reason for the link between physical and financial markets. It does not mean, however, that futures prices dominate physical prices, both interact in oil price formation.

The strong link between physical and futures prices can however be broken during a crisis, or when the fundamentals or physical and financial prices are clearly different. It was for example the case during the Gulf war, when the price of the financial contract lagged the increase in Dated Brent and Forward prices. The price of physical crude oil jumped after Iraq invaded Kuwait in August 1990, while the price of futures contracts reacted less to the event. The fact that Dated Brent and Forward Brent are linked to the physical delivery of crude oil explains this difference with futures prices. The same happened during the 2010 strikes at French refineries. Dated Brent price was the most affected by the strikes and futures prices the less impacted. Again, the fact that Dated Brent and Forward Brent prices are related to physical deliveries instead of cash settlement explains the difference.

The disconnection of various crude prices under strong pressure on one market or the other confirms that the market, and the process of oil price assessment, is able to separate factors affecting futures prices and physical prices of oil.

Conclusion

Over time oil markets have developed a high degree of sophistication, allowing a very precise pricing of the time component in oil exchanges – particularly crucial for the industry. PRAs have evolved, from being price reporters to trade organisers in

an attempt to avoid price manipulations and misreporting. Main markers in OTC trades have become more transparent, submitted to very precise rules and controlled by PRA editors. Most large oil traders are part of the process, as they want to see their trade activity reflected in prices and have a chance to influence prices. PRAs' assessments are based on voluntary participation, but are difficult to avoid.

PRAs' changes in methodology since the early 2000s, first aimed at avoiding price manipulation, seem today to have provided the tools to potentially isolate physical and futures markets. The methodology developed first to combat squeezes and price game play is used today to assess the physical market, in theory independently from the futures markets. Futures and physical prices are not equivalent and, although there is a strong link between futures and forward, the process of assessment of physical prices guarantees that these prices can evolve differently, if need be. Futures prices are likely to exhibit from time to time a dynamic that will not always reflect the shape of the physical market. In these cases, when the oil financial market temporarily disconnects from physical oil market fundamentals, physical oil trading must rely on a physical benchmark to price its trades. It is precisely the role of PRAs to assess physical markers that could continue to be used in physical trading, in theory independently from futures prices prevailing in a particular day. The existence of such prices is an anchor for futures markets, and should guarantee that they do not disconnect too long from oil fundamentals. ■

** A longer version of this article can be found on the OIES website*